

## CLAIMS

1. A method of producing an alumina film mainly in a crystal structure, characterized in that in forming the alumina film mainly in a crystal structure on a substrate (including a substrate having a film previously formed thereon), the surface of the substrate is treated with a ceramic powder mainly having the crystal structure same as that of alumina in the a crystal structure.

2. The method of producing an alumina film according to Claim 1, wherein the ceramic powder used is an alumina powder in a crystal structure

3. The method of producing an alumina film according to Claim 2, wherein the alumina powder used has an average particle diameter of 50  $\mu\text{m}$  or less

4. The method of producing an alumina film according to Claim 1, wherein the substrate used has a film formed on the surface thereof made of one or more compounds selected from the group consisting of compounds of one or more elements selected from the group consisting of elements in Groups 4a, 5a and 6a in the periodic table, Al, Si and Y with one or more elements of C, N, B, and O; the solid solutions thereof; and compounds of one or more elements of C, N, and B.

5. The method of producing an alumina film according to Claim 4, wherein the substrate used has a hard film formed on the surface thereof containing one or more compounds selected from the group consisting of TiN, TiC, TiCN, TiAlN and TiAlCrN.

6. The method of producing an alumina film according to Claim 1, wherein the substrate surface treatment includes a step of polishing the substrate surface with the ceramic powder.

7. The method of producing an alumina film according to Claim 1, wherein the substrate surface treatment includes a step of immersing and ultrasonically treating the substrate in a liquid in which the ceramic powder is dispersed

8. The method of producing an alumina film according to Claim 1, wherein the alumina film is formed by a gas-phase growth method.

9. The method of producing an alumina film according to Claim 8, wherein the gas-phase growth method used is a method selected from the group consisting of CVD, PE-CVD, sputtering, ion plating and vapor deposition.

10. A method of producing a laminated film-coated part, characterized in that an alumina film mainly in  $\alpha$  crystal structure is formed on the film by using the method according to Claim 1.

11. A method of producing a laminated film-coated part, characterized by including: a step of forming a hard film containing one or more compounds selected from the group consisting of TiN, TiC, TiCN, TiAlN and TiAlCrN on a substrate, a step of treating the substrate surface with a ceramic powder mainly having the crystal structure same as that of alumina in the  $\alpha$  crystal structure, and a step of forming an alumina film mainly in  $\alpha$  crystal structure on the substrate after the treatment, wherein the processing is performed in that order.